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1

00:32 1 appearances.  
 00:32 2 MR. WONG: Ryan Wong from Keker Van Nest for  
 00:32 3 defendant Real Networks.  
 00:32 4 MR. PAK: Sean Pak of Quinn Emanuel  
 00:32 5 representing Cisco and the witness.  
 00:32 6 THE VIDEOGRAPHER: Thank you.  
 00:32 7 If the court reporter would please swear the  
 00:32 8 witness, we can begin.  
 9  
 10 TONG LIU,  
 11 having been sworn as a witness,  
 12 by the Certified Shorthand Reporter,  
 13 testified as follows:  
 14  
 15 EXAMINATION  
 16 BY MR. WONG:  
 00:33 17 Q Good morning, Ms. Liu.  
 00:33 18 A **Good morning.**  
 00:33 19 Q Please state your full name for the record.  
 00:33 20 A **Tong Liu.**  
 00:33 21 Q Do you go by any other names, Ms. Liu?  
 00:33 22 A **At work I go with Toni.**  
 00:33 23 Q Could you spell Toni for me, please?  
 00:33 24 A **T-O-N-I.**  
 00:33 25 Q Okay. Have you gone by Toni Liu for what

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1 PALO ALTO, CALIFORNIA  
 2 FRIDAY, JANUARY 15, 2016  
 3 9:32 a.m.  
 4  
 5  
 6 THE VIDEOGRAPHER: Good morning. We are on  
 7 the record at 9:32 on January 15th of the year 2016.  
 8 This is the video deposition of Tong Liu. My name is  
 9 Kevin Foor. I'm here with court reporter Andrea  
 10 Ignacio, and we're here from Veritext Legal Solutions  
 11 at the request of Keker Van Nest.  
 12 This deposition is being held at Wilson  
 13 Sonsini Goodrich & Rosati in Palo Alto.  
 14 The caption of the case is Cisco Systems,  
 15 Inc., v Arista Networks. That is case 514-CV-05344  
 16 ELF BSG.  
 17 Please note that audio and video recording  
 18 will take place unless all party the agree to go off  
 19 the record. Microphones are sensitive and may pick up  
 20 whisper, private conversations and cell interference.  
 21 I'm not related to any party in this action,  
 22 nor am I interested financially in the outcome in any  
 23 way. If there are any objections to proceeding,  
 24 please state them at the time of your appearance.  
 25 And if you would please state your

00:33 1 period of time have you gone by Toni Liu?  
 00:33 2 A **That name is only used at work. It's not an**  
 00:33 3 **officially alternative name.**  
 00:33 4 Q And besides Toni Liu have you gone by any  
 00:33 5 other names, Ms. Liu?  
 00:33 6 A **No.**  
 00:33 7 Q Could you please state your home address?  
 00:33 8 A [REDACTED]  
 00:33 9 Q And do you have any personal e-mail addresses  
 00:33 10 that you use?  
 00:33 11 A **Yes.**  
 00:33 12 Q Could you please tell me what those are?  
 00:33 13 A [REDACTED].  
 00:34 14 Q Okay. Any other e-mails addresses?  
 00:34 15 A [REDACTED].  
 00:34 16 Q Who is your current employer, Ms. Liu?  
 00:34 17 A [REDACTED].  
 00:34 18 Q Do you have a work address for Aruba  
 00:34 19 Networks?  
 00:34 20 A [REDACTED].  
 00:34 21 Q Do you have an e-mail work address for your  
 00:34 22 job at Aruba?  
 00:34 23 A [REDACTED].  
 00:34 24 Q Now, Ms. Liu are you represented by counsel  
 00:34 25 at this deposition?

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03:06 1 Q I see.  
 03:06 2 So you read the -- and by the spec you mean  
 03:06 3 the IEEE PTP spec  
 03:06 4 A Yes.  
 03:06 5 Q During the break, the court reporter marked  
 03:06 6 as Exhibit No. 93 the document right there to your  
 03:06 7 right, and counsel here's a copy for you as well.  
 03:06 8 MR. PAK: Thanks.  
 03:06 9 MR. WONG: The document bears control numbers  
 03:07 10 Arista NDCA00031733 to '32021.  
 03:07 11 Q Ms. Liu, you can take your time to look at  
 03:07 12 the document, but the question that I have for you is  
 03:07 13 do you recognize this document marked as Exhibit 93?  
 03:07 14 A Yes, I -- think is the one we used, as well  
 03:08 15 as the standard.  
 03:08 16 Q Okay. Can you read the title of the IEEE  
 03:08 17 specification marked as Exhibit 93?  
 03:08 18 A IEEE standard for the precision clock  
 03:08 19 synchronization protocol for network measurement and  
 03:08 20 control systems.  
 03:08 21 Q And the -- the -- I guess the number for the  
 03:08 22 standard on the bottom right is IEEE standard  
 03:08 23 1588-2008; do you see that?  
 03:08 24 A Yes, uh-huh.  
 03:08 25 Q And this is the PTP IEEE standard that we

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03:08 1 have been talking about in this deposition; correct?  
 03:08 2 A Yes.  
 03:08 3 Q Okay. So -- so the exhibit marked as 93 is  
 03:08 4 the standard that you reviewed before you began coding  
 03:08 5 the PTP functionality for the Cisco industrial  
 03:08 6 Ethernet device; correct?  
 03:08 7 A Yes.  
 03:08 8 Q Okay. And did you read the entire standard  
 03:09 9 before you began working on the PTP functionality?  
 03:09 10 A Yeah, I believe I read the -- the entire or  
 03:09 11 the majority of part of it.  
 03:09 12 Q That's -- that's impressive.  
 03:09 13 How -- the standard is -- is several hundred  
 03:09 14 pages long, but you read the whole thing? You  
 03:09 15 remember reading the whole thing.  
 03:09 16 A Yes.  
 03:09 17 Q Did you consult with the standard marked as  
 03:09 18 Exhibit 93 while you were coding the PTP functionality  
 03:09 19 for Cisco's industrial Ethernet devices?  
 03:09 20 A Yes, all of the messages format, the field  
 03:09 21 definitions behaviors are documented here.  
 03:09 22 Q Okay. So -- so every PTP functionality --  
 03:09 23 every aspect of PTP functionality that you implemented  
 03:10 24 in Cisco's industrial ethernet devices are based on  
 03:10 25 the IEEE standard marked as Exhibit 93?

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03:10 1 MR. PAK: Objection; mischaracterizes the  
 03:10 2 witness's testimony.  
 03:10 3 MR. WONG: Q. Correct?  
 03:10 4 MR. PAK: Assumes facts not in evidence.  
 03:10 5 THE WITNESS: There are multiple parts of it  
 03:10 6 for the implementation part. There is the protocol  
 03:10 7 part which are the messages, the state machine, the  
 03:10 8 field definitions. Those are the base of the spec. There  
 03:10 9 are the way we calculate the clock difference. Those  
 03:10 10 are not documented here. Those are what we developed  
 03:10 11 and there's also the CLI command which we came up with  
 03:10 12 separately.  
 03:10 13 MR. WONG: Q. When you say messages, what do  
 03:11 14 you mean by messages?  
 03:11 15 A So the PTP protocol has, if I recall, has  
 03:11 16 multiple set -- is a handshaking message. So the  
 03:11 17 format of the message which one follows what, which  
 03:11 18 field is contained in which message, those are the  
 03:11 19 find in the spec.  
 03:11 20 Q Okay. When you follow those definitions when  
 03:11 21 you implemented the PTP functionality in Cisco's  
 03:11 22 industrial Ethernet devices; right?  
 03:11 23 A Yes, the format of the messages.  
 03:11 24 Q Okay. You also mentioned field definitions.  
 03:11 25 What do you mean by field definitions?

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03:11 1 A Those are inside of the message itself.  
 03:11 2 Q Okay. What are fields?  
 03:11 3 A Like header, checksum. There are time stamps  
 03:11 4 inside of the message and how big -- how wide the  
 03:12 5 field is. So those, those are the field definitions  
 03:12 6 which have specific meaning inside of the message.  
 03:12 7 Q And those are specified in the IEEE PTP  
 03:12 8 standard; right?  
 03:12 9 A Yes.  
 03:12 10 Q And you followed those standards when  
 03:12 11 implementing the PTP functionality in Cisco's  
 03:12 12 industrial Ethernet products; right?  
 03:12 13 MR. PAK: Objection; available.  
 03:12 14 THE WITNESS: For the messages, yes.  
 03:12 15 MR. WONG: Q. And for the field definitions  
 03:12 16 as well?  
 03:12 17 A The field definition -- if you mean the --  
 03:12 18 how wide the field is, which field needs to follow  
 03:12 19 which one, yes. But particularly on the name of the  
 03:12 20 field, that may not necessarily be the same as the  
 03:12 21 spec.  
 03:12 22 Q Okay. Did you have any role in developing  
 03:12 23 the PTP standard marked as Exhibit 93?  
 03:13 24 A You mean contributing to the standard itself.  
 03:13 25 Q Yes.

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03:19 1 right?  
 03:19 2 **A Right.**  
 03:19 3 **Q** And these are acronyms and abbreviations that  
 03:19 4 are used in the PTP IEEE standard; correct?  
 03:19 5 **A Yes.**  
 03:19 6 **Q** And on the following page, page 8, there is  
 03:20 7 an acronym PTP there; do you see that?  
 03:20 8 **A Yes.**  
 03:20 9 **Q** It stands for precision time protocol?  
 03:20 10 **A Yes.**  
 03:20 11 **Q** So it was well-known that PTP meant precision  
 03:20 12 time protocol; correct?  
 03:20 13 MR. PAK: Objection; calls for speculation  
 03:20 14 assumes facts not in evidence; calls for expert  
 03:20 15 testimony.  
 03:20 16 THE WITNESS: When you say well-known, is  
 03:20 17 it -- what's the scope of well known?  
 03:20 18 MR. WONG: It was well known by people in the  
 03:20 19 networking industry; right?  
 03:20 20 MR. PAK: Same.  
 03:20 21 MR. WONG: That PTP meant precision time  
 03:20 22 protocol?  
 03:20 23 MR. PAK: Same objections.  
 03:20 24 THE WITNESS: I don't think it's well known  
 03:20 25 in the entire networking industry.

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03:22 1 industrial Ethernet device in a different way than  
 03:22 2 what PTP means in Exhibit 93?  
 03:22 3 MR. PAK: Objection; vague.  
 03:22 4 MR. WONG: Let me rephrase the question.  
 03:22 5 **Q** In the five commands that you're associated  
 03:22 6 with in Exhibit 92  
 03:22 7 **A Right.**  
 03:22 8 **Q** -- all of them use the acronym PTP; correct?  
 03:22 9 **A Yes.**  
 03:22 10 **Q** That PTP refers to the same PTP that is same  
 03:22 11 shown on page 8 of Exhibit 93; right?  
 03:22 12 MR. PAK: Objection; vague.  
 03:22 13 THE WITNESS: I think when I chose the  
 03:22 14 command, yes. I used PTP to mean the same as  
 03:22 15 precision time protocol.  
 03:22 16 MR. WONG: Right. As in the spec.  
 03:22 17 **Q** As in the spec. And in fact as is object  
 03:23 18 Feige Exhibit 93 which lists PTP -- which lists PTP as  
 03:23 19 an acronym; correct?  
 03:23 20 MR. PAK: Objection; vague.  
 03:23 21 THE WITNESS: I would say the meanings are  
 03:23 22 the same, that they mean precision time protocol.  
 03:23 23 MR. WONG: Well, the words are the same too,  
 03:23 24 PTP in the command is the same three letter that is  
 03:23 25 appear on page 8 of Exhibit 93; correct?

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03:20 1 MR. WONG: Okay.  
 03:20 2 **Q** Was there a subset of the networking industry  
 03:20 3 where PTP was known to refer to the PTP in Exhibit 93?  
 03:20 4 MR. PAK: Objection; vague; calls for  
 03:20 5 speculation; assumes facts not in evidence.  
 03:20 6 THE WITNESS: It's not as normal a term as IP  
 03:21 7 or MAC. The -- the term is still, I think, even for  
 03:21 8 people who are working on the Catalyst switches. It's  
 03:21 9 not a very well known term.  
 03:21 10 MR. WONG: Okay.  
 03:21 11 **Q** But certainly the IEEE standard marked as  
 03:21 12 Exhibit 93 defines the PTP acronym; correct?  
 03:21 13 **A Yes.**  
 03:21 14 **Q** And uses the PTP acronym?  
 03:21 15 **A Yes.**  
 03:21 16 **Q** To describe precision time protocol; correct?  
 03:21 17 **A True.**  
 03:21 18 **Q** And it uses that PTP acronym to describe the  
 03:21 19 PTP functionality that you implemented in Cisco's  
 03:21 20 industrial Ethernet devices; right?  
 03:21 21 MR. PAK: Objection; assumes facts not in  
 03:21 22 evidence; mischaracterizes the witness's prior  
 03:21 23 testimony.  
 03:21 24 THE WITNESS: In this spec, yes.  
 03:21 25 MR. WONG: Well, is PTP used in Cisco's

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03:23 1 THE WITNESS: It's the same acronym.  
 03:23 2 **Q** And they're referring to the same protocol;  
 03:23 3 correct?  
 03:23 4 **A Yes.**  
 03:23 5 **Q** Now, in turn to page 4 of Exhibit 93?  
 03:23 6 **A Okay.**  
 03:23 7 **Q** You can take off the -- well?  
 03:24 8 **A This is.**  
 03:24 9 **Q** Maybe you want to keep that together,  
 03:24 10 actually.  
 03:24 11 **A Right.**  
 03:24 12 **Q** On page 4 of exhibit 93 there's a large  
 03:24 13 heading number three entitled "definitions, acronyms  
 03:24 14 and abbreviations"; do you see that?  
 03:24 15 **A Yes.**  
 03:24 16 **Q** And in subsection 3.1 says Definitions; do  
 03:24 17 you see that?  
 03:24 18 **A Yes.**  
 03:24 19 **Q** Definition 3.1.4 in the IEEE PTP  
 03:24 20 specification defines the term clock; do you see that?  
 03:24 21 **A Yes, uh-huh.**  
 03:24 22 **Q** What is the definition of clock in the IEEE  
 03:24 23 standard?  
 03:24 24 **A It's no participating in the precision time**  
 03:24 25 **protocol. PTP that is capable of providing a**

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03:56 1 you're talking about now, you didn't work on  
 03:56 2 developing that; correct?  
 03:56 3 **A No, I didn't.**  
 03:56 4 **Q** That -- that existed at the time you proposed  
 03:56 5 adding these PTP commands to Cisco's routing software;  
 03:56 6 correct?  
 03:56 7 **A Yes.**  
 03:56 8 **Q** And if you look briefly at Exhibit 96, let me  
 03:56 9 know when you're there?  
 03:57 10 **A Yes.**  
 03:57 11 **Q** Under interface level config commands, listed  
 03:57 12 there is PTP sync interval with a hyphen; do you see  
 03:57 13 that?  
 03:57 14 **A PTP sync interval, yes.**  
 03:57 15 **Q** With a hyphen?  
 03:57 16 **A With a hyphen.**  
 03:57 17 **Q** Doing a sync interval?  
 03:57 18 **A Right.**  
 03:57 19 **Q** Did you remove the hyphen based upon Mr.  
 03:57 20 Woodman's directive?  
 03:57 21 **A Yes, I believe that should be true.**  
 03:57 22 **Q** And the purpose of removing the hyphen as  
 03:57 23 described in Mr. Woodman's e-mail marked as Exhibit 97  
 03:57 24 was to take advantage of the auto complete  
 03:57 25 functionality; correct?

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03:58 1 originate from you?

03:58 2 MR. PAK: Objection; vague.  
 03:59 3 THE WITNESS: A lot of Cisco CLI commands  
 03:59 4 has -- have hierarchies. That part I knew even before  
 03:59 5 I developed these commands.  
 03:59 6 MR. WONG: Okay.  
 03:59 7 **Q** So the organization of Cisco commands in a  
 03:59 8 hierarchy existed before you started adding PTP  
 03:59 9 commands to the software?  
 03:59 10 **A Yes.**  
 03:59 11 **Q** And you were aware of that?  
 03:59 12 **A I'm -- yeah, I was aware of that.**  
 03:59 13 **Q** Right.  
 03:59 14 So you modeled -- you modeled your commands  
 03:59 15 based upon the hierarchy concept that already existed  
 03:59 16 in Cisco software?  
 03:59 17 MR. PAK: Objection; vague.  
 03:59 18 THE WITNESS: I think I was thinking it would  
 03:59 19 be good to have that part for these CLI commands.  
 03:59 20 MR. WONG: Okay. Okay. I think it's a good  
 04:00 21 time to take a break.  
 04:00 22 THE VIDEOGRAPHER: It is 1:01. We're going  
 04:00 23 off the record.  
 04:00 24 (Lunch break taken at 1:01 p.m.)  
 04:39 25 ---oOo---

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03:57 1 MR. PAK: Objection; mischaracterizes the  
 03:57 2 witness's testimony; incomplete.  
 03:57 3 THE WITNESS: I would same both, auto  
 03:57 4 completion and hierarchy.  
 03:57 5 MR. WONG: Q. What --  
 03:57 6 **A As --**  
 03:57 7 **Q** Go ahead.  
 03:57 8 **A You go ahead first.**  
 03:57 9 **Q** What -- in your mind, what is the difference  
 03:57 10 between auto completion functionality and hierarchy?  
 03:58 11 **A Hierarchy, let's say there is PTP sync**  
 03:58 12 **interval. PTP limit. So when you type PTP sync and**  
 03:58 13 **then question mark that gives you you the next level**  
 03:58 14 **of that command which is interval. So this is**  
 03:58 15 **hierarchy part which won't be there if there's a**  
 03:58 16 **hyphen.**  
 03:58 17 So all of them would be under PTP and you  
 03:58 18 have all of the options.  
 03:58 19 **Q** Did you come up with the idea to have a  
 03:58 20 hierarchy for these PTP commands?  
 03:58 21 MR. PAK: Objection; vague.  
 03:58 22 THE WITNESS: Meaning can you rephrase that?  
 03:58 23 Did I come up with the concept?  
 03:58 24 MR. WONG: You just described the concept of  
 03:58 25 a hierarchy. Was that concept -- did that concept

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04:39 1 A F T E R N O O N S E S S I O N  
 04:39 2 1:41 p.m.  
 04:39 3  
 04:39 4  
 04:39 5 THE VIDEOGRAPHER: We are back on the record  
 04:40 6 at 1:41.  
 04:40 7 MR. WONG: Q. So, Ms. Liu, before the lunch  
 04:40 8 break, we talked about the five commands that are  
 04:40 9 associated with you in Exhibit 92.  
 04:40 10 **A Yes.**  
 04:40 11 **Q** One of the commands is PTP priority 1.  
 04:40 12 **A Yes.**  
 04:40 13 **Q** Do you see that?  
 04:40 14 **A Uh-huh.**  
 04:40 15 **Q** What is the function that the PTP priority 1  
 04:40 16 command performs?  
 04:40 17 **A It configures the priority 1 parameter for**  
 04:40 18 **the PTP clock.**  
 04:40 19 **Q** Okay. When you say for the PTP clock, you  
 04:40 20 mean PTP as defined by the IEEE standard; right?  
 04:40 21 **A Yes.**  
 04:40 22 **Q** You're not talking about a different PTP  
 04:40 23 that's separate from the IEEE standard; right?  
 04:40 24 **A No.**  
 04:40 25 **Q** Okay. And the PTP in the command PTP

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04:41 1 priority 1 refers to the IEEE standard; correct?

04:41 2 MR. PAK: Objection; vague.

04:41 3 THE WITNESS: It refers to, yeah, PTP.

04:41 4 MR. WONG: It refers to the IEEE PTP standard

04:41 5 that we marked at Exhibit 93; correct?

04:41 6 THE WITNESS: Yes.

04:41 7 Q Okay. And use of the word PTP in all five of

04:41 8 the commands that are associated with you in

04:41 9 Exhibit 92, they all come from the IEEE standard

04:41 10 marked as Exhibit 93; correct?

04:41 11 MR. PAK: Objection; vague; mischaracterizes

04:41 12 the witness's testimony.

04:41 13 THE WITNESS: You mean the PTP --

04:41 14 MR. WONG: Let me ask the question --

04:41 15 A -- word in the command?

04:41 16 Q Yes. Let me ask a clean question.

04:41 17 The use of the word PTP in all five of the

04:41 18 commands that are associated with you in Exhibit 92 --

04:41 19 A Right.

04:41 20 Q -- that word came from the PTP IEEE standard

04:42 21 that was marked as Exhibit 93; correct?

04:42 22 MR. PAK: Same objections.

04:42 23 THE WITNESS: Yes, it means the same.

04:42 24 MR. WONG: Okay.

04:42 25 Q And you -- in describing the function

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04:43 1 MR. PAK: Objection; vague.

04:43 2 THE WITNESS: Yes, I think I chose it for the

04:43 3 intention to mean the priority 1 attribute of the

04:43 4 clock.

04:43 5 MR. WONG: Q. And is your answer the same

04:43 6 for the command PTP priority 2? Is the priority 2

04:43 7 command parameter, does that refer to the priority 2

04:43 8 attribute in the IEEE standard marked as Exhibit 93?

04:44 9 MR. PAK: Same objection.

04:44 10 THE WITNESS: It's referring to the same,

04:44 11 that attribute, yes.

04:44 12 MR. WONG: That attribute in the IEEE

04:44 13 standard. In the IEEE standard, yes.

04:44 14 Q Okay. And the new about the priority 1 and

04:44 15 priority 2 attributes in the IEEE standard before you

04:44 16 started adding the PTP priority 1 and PTP priority 2

04:44 17 commands to the iOS software; correct?

04:44 18 A Yes, I read the spec.

04:44 19 Q And you were aware of those two particular

04:44 20 attributes before you started adding the PTP priority

04:44 21 1 and PTP priority 2 commands to Cisco's routing

04:44 22 software; right?

04:44 23 A Yes.

04:44 24 Q How long did it take you to come up with the

04:44 25 PTP priority 1 command?

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04:42 1 performed by the PTP priority 1 command, you testified

04:42 2 that it configures the priority 1 parameter for the

04:42 3 PTP clock; correct?

04:42 4 A Yes.

04:42 5 Q And the priority 1 parameter for the PTP

04:42 6 clock, that's the same priority 1 parameter that we

04:42 7 discussed in Exhibit 93; correct?

04:42 8 A When you say parameter, I think they are a

04:42 9 little different in the CLI and the spec.

04:42 10 Q How are they different?

04:42 11 A The -- in the spec it's the attribute of the

04:42 12 clock, right. When I say parameter, I mean the -- in

04:43 13 the context of the CLI command is a parameter.

04:43 14 Q Oh, I see.

04:43 15 So -- so the word priority 1 in the PTP

04:43 16 priority 1 CLI command is a parameter of the command

04:43 17 A Yes.

04:43 18 Q That's what you mean by --

04:43 19 A Right.

04:43 20 Q -- parameter?

04:43 21 A Right.

04:43 22 Q Okay. Now, does the priority 1 parameter in

04:43 23 the CLI command, PTP priority 1, does that refer to

04:43 24 the priority 1 attribute in the IEEE standard marked as

04:43 25 as Exhibit 93?

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04:44 1 A I don't remember how long it took for me to

04:45 2 come up with the list of CLI commands.

04:45 3 Q Okay. I am just asking about the -- the one

04:45 4 command PTP priority 1.

04:45 5 A Right.

04:45 6 Q Did that take you an hour to come up with

04:45 7 that command?

04:45 8 MR. PAK: Objection; vague.

04:45 9 THE WITNESS: You mean just to decide on the

04:45 10 syntax on the commands?

04:45 11 MR. WONG: On the two words in the command,

04:45 12 that's right.

04:45 13 Q How long did it take you to decide on the two

04:45 14 words PTP priority 1 in that command?

04:45 15 A I don't remember.

04:45 16 Q Did it take you more than a day?

04:45 17 MR. PAK: Objection; vague.

04:45 18 THE WITNESS: Maybe not. I don't recall the

04:45 19 details of -- of this level.

04:45 20 MR. WONG: Okay do you?

04:45 21 THE WITNESS: How long, yeah.

04:45 22 Q Are you done with your answer?

04:45 23 A Right. Yes, I'm done with my answer.

04:45 24 Q Okay. Do you know if it took you just a few

04:45 25 minutes?

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04:51 1 the source code for those five commands associated  
 04:51 2 with you in Exhibit 92?

04:51 3 **A No, I wrote all of them.**

04:51 4 **Q** The PTP sync interval command --

04:51 5 **A Yes.**

04:51 6 **Q** -- well, actually just for charity, what  
 04:51 7 function does the PTP priority 2 command perform?

04:51 8 **A It configures another parameter which helps**  
 04:51 9 **to determine the -- the clock.**

04:51 10 **Q** And that other parameter you're talking about  
 04:52 11 is the priority 2 attribute that is defined by the  
 04:52 12 IEEE standard marked as Exhibit 93; correct?

04:52 13 **A Yes.**

04:52 14 **Q** Okay. What function does the PTP sync  
 04:52 15 interval command perform?

04:52 16 **A It configures how often the clock sync with**  
 04:52 17 **the master.**

04:52 18 **Q** And do you recall earlier we were looking at  
 04:52 19 the IEEE standard marked as Exhibit 93 and a term  
 04:52 20 called sync interval in there?

04:52 21 **A Right.**

04:52 22 **Q** Is the sync interval that the PTP sync  
 04:52 23 interval command refers to the same sync interval that  
 04:52 24 we discussed in Exhibit 93?

04:52 25 MR. PAK: Objection; vague.

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04:54 1 **Q** And your answer is the same for the priority  
 04:54 2 2 attribute defined in the IEEE standard, correct,  
 04:54 3 with respect to the PTP priority 2 command?

04:54 4 **A Yes.**

04:54 5 **Q** And you chose the words sync interval because  
 04:54 6 the IEEE standard marked as Exhibit 93 described --  
 04:54 7 strike that.

04:54 8 You chose the words sync interval because the  
 04:54 9 IEEE standard marked as Exhibit 93 also used the word  
 04:54 10 sync interval; correct?

04:54 11 MR. PAK: Objection; vague.

04:54 12 THE WITNESS: When you say that, it makes me  
 04:54 13 feel that you -- it's a direct translate from the spec  
 04:54 14 to the command. Is that what you mean?

04:55 15 MR. WONG: No, no --

04:55 16 THE WITNESS: -- when you ask the question?

04:55 17 MR. WONG: No, no. My question is simply did  
 04:55 18 you -- you testified that the -- one second.

04:55 19 **Q** Can you tell me again what the function is  
 04:55 20 that the PTP sync interval performs?

04:55 21 **A It configures or determined how often the**  
 04:55 22 **clock sync with the master clock.**

04:55 23 **Q** And that functionality is described in the  
 04:55 24 IEEE standard; correct?

04:55 25 **A Yes.**

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04:52 1 THE WITNESS: I think that was -- this  
 04:52 2 command was used, was defined to be used to configure  
 04:52 3 that part of the clock.

04:52 4 MR. WONG: Right.

04:52 5 **Q** And by that part of the clock, you mean the  
 04:53 6 sync interval attribute defined by the IEEE PTP  
 04:53 7 standard; right?

04:53 8 **A Yes.**

04:53 9 **Q** Now, you chose the term priority 1 because  
 04:53 10 priority 1 is an attribute that's in the IEEE  
 04:53 11 standard; right?

04:53 12 MR. PAK: Objection; vague.

04:53 13 THE WITNESS: You mean when I wrote the  
 04:53 14 command?

04:53 15 MR. WONG: When you --

04:53 16 THE WITNESS: When I -- when I chose to use  
 04:53 17 priority 1; right?

04:53 18 MR. WONG: Yes, that's what I'm asking.

04:53 19 THE WITNESS: Yes, when I chose the word, I  
 04:53 20 meant to configure this attribute for the will clock.

04:53 21 That was was true.

04:53 22 MR. WONG: Q. And this attribute for the  
 04:53 23 clock, you're referring to the priority 1 attribute  
 04:53 24 that's defined in the IEEE standard; right.

04:54 25 THE WITNESS: Yes.

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04:55 1 **Q** And the IEEE standard uses the term sync  
 04:56 2 interval to describe what you just transcribed as the  
 04:56 3 function of the PTP sync interval command; right?

04:56 4 MR. PAK: Objection; vague.

04:56 5 THE WITNESS: It's the same meaning.

04:56 6 MR. WONG: Okay.

04:56 7 **Q** So you chose the words sync interval for the  
 04:56 8 PTP sync interval command because the IEEE standard  
 04:56 9 used the same term to describe what the command does;  
 04:56 10 right?

04:56 11 MR. PAK: Objection; vague.

04:56 12 THE WITNESS: I chose it based on my  
 04:56 13 understanding of the spec and so it's -- it's just a  
 04:56 14 preface of how -- how to express this, how -- how to  
 04:57 15 express this parameter in the -- for the user  
 04:57 16 interface. I wouldn't say it's directly because it's  
 04:57 17 in the spec that's why I use it.

04:57 18 MR. WONG: Well, you wouldn't call -- so the  
 04:57 19 IEEE has a priority 1 attribute; right?

04:57 20 THE WITNESS: Right.

04:57 21 **Q** And it's a requirement of the PTP standard;

04:57 22 right?

04:57 23 **A Yes.**

04:57 24 **Q** Would you call the priority 1 standard  
 04:57 25 priority 2 in a command if the command sets the

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04:57 1 priority 1 attribute?

04:57 2 MR. PAK: Objection; vague.

04:57 3 THE WITNESS: No I would set it as priority

04:57 4 1.

04:57 5 MR. WONG: Right.

04:57 6 THE WITNESS: Not priority 2.

04:57 7 MR. WONG: Q. And that's because you want

04:57 8 the command to match the same term that's used in the

04:57 9 standard; right?

04:57 10 MR. PAK: Objection; mischaracterizes the

04:57 11 witness' testimony.

04:57 12 MR. WONG: Let me rephrase the question.

04:58 13 Q For a command PTP priority 1 that sets an

04:58 14 attribute that's called priority 1 in the spec, you

04:58 15 should use the same word in the command; correct?

04:58 16 MR. PAK: Objection; assumes facts not in

04:58 17 evidence.

04:58 18 THE WITNESS: No, I don't think that part was

04:58 19 true. For example, you could use clock priority 1.

04:58 20 Clock priority 2, right. There -- there is no direct

04:58 21 association of what I use in the command line CLI that

04:58 22 it has to match this spec. That's the -- that -- they

04:58 23 are not equal.

04:58 24 MR. WONG: Okay.

04:58 25 Q Well, priority 1 has a particular meaning in

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04:58 1 the PTP context; correct?

04:58 2 A Yes.

04:58 3 Q And the PTP priority 1 command performs the

04:59 4 function in the PTP context; correct?

04:59 5 MR. PAK: Objection; vague; incomplete

04:59 6 hypothetical.

04:59 7 THE WITNESS: The -- yes, priority attribute

04:59 8 is an important part of a PTP clock.

04:59 9 MR. WONG: Q. And you chose commands that

04:59 10 would be clear to a user trying to set these industry

04:59 11 standard attributes; right?

04:59 12 MR. PAK: Objection; assumes facts not in

04:59 13 evidence; mischaracterizes the witness's testimony.

04:59 14 THE WITNESS: I think I chose it based on my

04:59 15 understanding of the spec and I don't remember using

04:59 16 it because it's in the spec.

04:59 17 MR. WONG: But you had reviewed the spec

04:59 18 entirely before you started adding these five commands

05:00 19 associated with you in Exhibit 92; correct?

05:00 20 A I did review the spec, yes.

05:00 21 Q So you -- so you were aware that these terms

05:00 22 were defined in the IEEE specification marked as

05:00 23 Exhibit 93 before you added the five commands

05:00 24 associated with you in Exhibit 92; right?

05:00 25 MR. PAK: Objection; vague.

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05:00 1 THE WITNESS: When you say the five commands

05:00 2 that would include the show command which are

05:00 3 different, right, than these configure command?

05:00 4 MR. WONG: Sure.

05:00 5 Q Why don't we just limit the again then to the

05:00 6 three commands we were just talking about PTP priority

05:00 7 1?

05:00 8 A Right.

05:00 9 Q PTP priority 2 and PTP sync interval?

05:00 10 A Right.

05:00 11 Q You were aware that the terms priority 1,

05:00 12 priority 2, SIG interval and PTP were defined in the

05:01 13 IEEE specification marked as exhibit 93 before you

05:01 14 added those three commands to Cisco's routing

05:01 15 software; correct?

05:01 16 A I'm aware of those terms being defined in the

05:01 17 1588 standard.

05:01 18 Q Okay. Before you added those three commands

05:01 19 to the Cisco software; correct?

05:01 20 A Yes.

05:01 21 Q Okay. Now show PTP clock is another command

05:01 22 that you're associated with; correct?

05:01 23 A Yes.

05:01 24 Q What's the function performed by the show PTP

05:01 25 clock command?

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05:01 1 A It shows the status of the clock and I don't

05:01 2 recall the entire output from the command, but I think

05:01 3 that's probably summarize the majority of the output.

05:01 4 Q Okay. And as we discussed earlier in today's

05:01 5 deposition, the PTP IEEE specification defines the

05:02 6 term clock; correct?

05:02 7 A It defined the term clock, yes.

05:02 8 Q Okay. And the clock that is referred to in

05:02 9 the command show PTP clock is the clock that is

05:02 10 defined in the PTP standard; correct?

05:02 11 MR. PAK: Objection; vague.

05:02 12 THE WITNESS: Well, the command shows the PTP

05:02 13 clock status.

05:02 14 MR. WONG: And you refer to "the PTP clock"

05:02 15 in that response you just gave, you're referring to

05:02 16 the clock that is defined in the PTP standard;

05:02 17 correct?

05:02 18 A Yes, it means the clock.

05:02 19 Q Now, the -- the word "show" in that command,

05:02 20 were there other commands in iOS that used the word

05:03 21 "show" before you added this show PTP clock command to

05:03 22 the software?

05:03 23 A Yes.

05:03 24 Q Okay. You were familiar that other commands

05:03 25 used the first word of show to display information

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05:03 1 before you added the show PTP clock command; correct?

05:03 2 **A Yes.**

05:03 3 **Q** Okay. So you -- you simply followed what

05:03 4 other commands were doing when you chose the word show

05:03 5 in show PTP clock; is that right?

05:03 6 MR. PAK: Objection; assumes facts not in

05:03 7 evidence; mischaracterizes the witness's testimony.

05:03 8 MR. WONG: If anything that I'm saying --

05:03 9 THE WITNESS: Show.

05:03 10 **Q** Sorry.

05:03 11 **A** -- is a big category of commands. Like

05:03 12 there's debug, there is config, there is show. So

05:03 13 though is one big category of commands.

05:03 14 **Q** And there was a big -- and that category of

05:03 15 commands, the show commands, existed before you added

05:04 16 the show PTP clock to the command software; correct?

05:04 17 **A Yes.**

05:04 18 **Q** And you were just building upon that category

05:04 19 of commands when you used the word show in show PTP

05:04 20 clock; correct?

05:04 21 MR. PAK: Objection; mischaracterizes the

05:04 22 witness's testimony.

05:04 23 THE WITNESS: Yes, I think that -- that was

05:04 24 the intention.

05:04 25 MR. WONG: Q. And is the same

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05:06 1 it uses the term "parent" as shorthand for parent

05:06 2 clock?

05:06 3 **A Yes.**

05:06 4 **Q** Okay. Do you know if commands that use the

05:06 5 word show were used before they were used in Cisco's

05:06 6 software?

05:06 7 MR. PAK: Objection; calls for expert

05:06 8 testimony.

05:06 9 THE WITNESS: I'm not aware of that.

05:06 10 MR. WONG: Okay. I'm just asking whether you

05:06 11 personally know of. If you don't --

05:06 12 THE WITNESS: No, I don't.

05:06 13 **Q** -- that's fine. What's the next exhibit

05:07 14 number?

05:07 15 THE REPORTER: 98.

05:07 16 MR. WONG: Okay.

05:07 17 (Document marked Exhibit 98

05:07 18 for identification.)

05:07 19 MR. WONG: The court reporter has marked as

05:07 20 Exhibit 98 a document bearing control numbers

05:07 21 CSI-CLI-00194055 to '194800.

05:07 22 **Q** Ms. Liu, do you recognize this document?

05:07 23 **A I don't recognize this document.**

05:07 24 **Q** Okay. Have you seen Cisco command reference

05:07 25 guides before?

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05:04 1 explanation -- does the same explanation apply to show

05:04 2 PTP parent for the show aspect of that command.

05:04 3 **A Yes 74 the show aspect of the command, yes.**

05:04 4 **Q** Okay. What function does the show PTP parent

05:04 5 command perform?

05:04 6 **A It shows the status of the parent clock.**

05:04 7 **Q** When you say the parent clock, are you

05:05 8 referring to the parent clock as defined in the PTP

05:05 9 standards?

05:05 10 **A Yes.**

05:05 11 **Q** And you recall discussing the definition of

05:05 12 parent clock in the standards earlier in this

05:05 13 deposition; correct?

05:05 14 **A Yes.**

05:05 15 **Q** And another shorthand used by the IEEE

05:05 16 standard for parent clock is simply parent; correct?

05:05 17 MR. PAK: Objection; vague.

05:05 18 THE WITNESS: Can you refer me to that page.

05:05 19 MR. WONG: Sure. Sure. Absolutely. I think

05:05 20 it's on page 53 of Exhibit 93. It's in that sentence

05:06 21 maybe two-thirds of the way down on page 53 which

05:06 22 starts with ordinary and boundary clocks may keep

05:06 23 statistics.

05:06 24 **A Uh-huh, using the following attribute. Okay.**

05:06 25 **Q** So you would agree that in the IEEE standard,

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05:07 1 **A In general terms, right, not particular to**

05:08 2 **700 series?**

05:08 3 **Q** That's -- that's correct, in general terms.

05:08 4 **A Yes, I have.**

05:08 5 **Q** Does this appear to be a command reference

05:08 6 guide for the 700 series product based upon what you

05:08 7 have seen in terms of other manuals?

05:08 8 **A I think it's similar.**

05:08 9 **Q** Okay. Just a few questions about this

05:08 10 document.

05:08 11 If turn, please, to page 336. Control number

05:08 12 at the bottom is CSI-CLI-00194418.

05:08 13 **A Okay.**

05:08 14 **Q** Tell in when you're there.

05:08 15 **A Yes.**

05:08 16 **Q** This page of Exhibit 98 at the top says "PTP

05:09 17 priority 1"; correct?

05:09 18 **A Yes.**

05:09 19 **Q** And this -- this page purports to describe

05:09 20 the PTP priority 1 command that we've been talking

05:09 21 about today; correct?

05:09 22 **A Yes.**

05:09 23 **Q** Okay. Did you contribute at all to writing

05:09 24 the wrenches manuals for the commands that you added

05:09 25 to Cisco's routing software?

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05:54 1 MR. KAZI: Same, same objections.

05:54 2 THE WITNESS: There are -- there are multiple

05:54 3 ways achieving the same goal. It doesn't have to be

05:54 4 exactly the same.

05:54 5 MR. WONG: Q. Did you have that belief back

05:54 6 in 2008?

05:54 7 **A Yes, we -- we did config -- we did consider**

05:54 8 **multiple options when we came up with -- before we**

05:54 9 **finalize on the commands.**

05:54 10 Q Did you ever file any intellectual property

05:54 11 rights disclosures with the IEEE regarding the CLI

05:55 12 commands that you added to Cisco's devices in 2008

05:55 13 relating to PTP?

05:55 14 MR. PAK: Objection; calls for speculation.

05:55 15 THE WITNESS: I didn't file any claims.

05:55 16 MR. WONG: Q. Are you aware of anyone at

05:55 17 Cisco filing any intellectual property rights claims

05:55 18 with the IEEE relating to the PTP CLI commands that

05:55 19 were added in 2008?

05:55 20 MR. PAK: Same, same objections; calls for

05:55 21 speculation.

05:55 22 THE WITNESS: I myself do not know.

05:55 23 MR. WONG: Okay. All right. Well, subject

05:55 24 to any questions from your counsel, I have no further

05:55 25 questions for you at this time.

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05:57 1 the answer.

05:57 2 **A No, I didn't.**

05:57 3 Q Okay. And, Ms. Liu, do you have any stake in

05:57 4 the outcome of this case whatsoever?

05:57 5 **A No.**

05:57 6 Q Okay. Ms. Liu I want to go back to some of

05:57 7 the topics that were covered in your examination.

05:57 8 Early on in the day when you were being asked

05:57 9 questions by counsel from Arista one of the things you

05:57 10 said was that you had come up with the CLI commands

05:58 11 separately from the industry standard; do you recall

05:58 12 that testimony?

05:58 13 MR. WONG: Objection; misstates prior

05:58 14 testimony.

05:58 15 THE WITNESS: Yes.

05:58 16 MR. PAK: Okay.

05:58 17 Q Can you explain what you meant that CLI

05:58 18 commands -- that you had come up with the CLI commands

05:58 19 separately?

05:58 20 MR. WONG: Objection; misstates prior

05:58 21 testimony.

05:58 22 THE WITNESS: So I think by separately, I

05:58 23 think I mean the protocol and state machine is one

05:58 24 part. And after that's all done, we came up with the

05:58 25 CLI commands.

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05:55 1 MR. PAK: I do have some questions, so why

05:55 2 don't we switch.

05:55 3 THE VIDEOGRAPHER: Do you want to stay on?

05:55 4 MR. PAK: Yeah.

05:55 5 THE VIDEOGRAPHER: Okay. There's a couple of

05:56 6 them over there. One there and one there. Stereo.

05:56 7 Whatever works for you.

05:56 8

05:56 9 **EXAMINATION**

05:56 10 BY MR. PAK:

05:56 11 Q Good afternoon, Ms. Liu.

05:56 12 **A Good afternoon.**

05:56 13 Q Again, for the record this is Sean Pak of

05:56 14 Quinn Emanuel.

05:56 15 Ms. Liu, before we follow-up on some of the

05:57 16 topics that were discussed during your examination,

05:57 17 can you tell us whether you're being compensated for

05:57 18 your time working on this case or providing this

05:57 19 deposition

05:57 20 **A No, I was not.**

05:57 21 Q So you're not receiving any kind of monetary

05:57 22 compensation for your involvement in this case through

05:57 23 the subpoena; is that correct?

05:57 24 **A (Witness nods head.)**

05:57 25 Q Okay. And again can you verbally indicate

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05:58 1 MR. PAK: Q. And you were shown this IEEE

05:58 2 standard document, Exhibit No. 94; do you recall that?

05:58 3 **A 94. I'm trying to see which one is 94.**

05:59 4 Q It should be this one here -- oh, actually

05:59 5 sorry.

05:59 6 MR. WONG: That's right. Oh, I don't know

05:59 7 which one.

05:59 8 MR. PAK: No, no, I'm sorry. I believe we --

05:59 9 you had marked that as.

05:59 10 MR. WONG: If you're talking about the big

05:59 11 one it's 93 which is the standard.

05:59 12 MR. PAK: Yes. So if you look at Exhibit

05:59 13 No. 93.

05:59 14 THE WITNESS: Yes.

05:59 15 Q Do you recall that counsel for Arista showed

05:59 16 you this exhibit which is an IEEE standard for the

05:59 17 precision clock --

05:59 18 **A Yes.**

05:59 19 Q -- synchronization protocol?

05:59 20 And you testified earlier that you had

05:59 21 reviewed this standard document; correct

05:59 22 **A Yes.**

05:59 23 Q Okay. Ms. Liu, do you know based on your

05:59 24 understanding and review of the document as part of

05:59 25 your work for Cisco, do you know whether this standard

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05:59 1 requires any particular commands to be used for any of  
 05:59 2 the protocols that are specified?  
 05:59 3 **A When you say command, do you mean the CLI**  
 05:59 4 **command?**  
 05:59 5 **Q** Correct.  
 05:59 6 **A From my understanding, some of the attribute**  
 06:00 7 **attention shall be configurable, but whether it's**  
 06:00 8 **from the CLI command or some other interface, that's**  
 06:00 9 **the part which I think it's an option.**

06:00 10 **Q** And what are some examples, based on your  
 06:00 11 understanding of the specification, what are some  
 06:00 12 options that a designer like yourself would have in  
 06:00 13 terms of implementing the interface what the user sees  
 06:00 14 in terms of the various features specified in the nine  
 06:00 15 -- Exhibit 93 IEEE document?

06:00 16 **MR. WONG:** Objection; vague.

06:00 17 **THE WITNESS:** GUI interface could be one.

06:00 18 **MR. PAK:** When you say GUI, what do you mean  
 06:00 19 by that?

06:00 20 **THE WITNESS:** With like a web interface, drop  
 06:00 21 down manuals, common line interface could be one. And  
 06:01 22 predefined default or as the spec said some profiles  
 06:01 23 could be options as well, I think.

06:01 24 **Q** Based on your understanding of the IEEE  
 06:01 25 document, can you comply with the standard by using

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06:03 1 **part. That's the functionality of the protocol.**

06:03 2 As to what are the configurable parameters  
 06:03 3 or attribute of a clock, that was by design and by  
 06:03 4 choice. It's not defined in the -- it's not  
 06:03 5 completely defined in the spec.

06:03 6 **Q** So let's look at some of the specific  
 06:03 7 examples that were given to you. If you look at --  
 06:03 8 this is now separate document Exhibit No. 92.

06:03 9 **A Okay.**

06:03 10 **Q** Do you see on page 24 of that document the  
 06:03 11 CLI command PTP priority 1?

06:03 12 **A Yes.**

06:03 13 **Q** Is it possible to the functionality of PTP  
 06:04 14 priority 1 using a different command than the one that  
 06:04 15 you selected?

06:04 16 **MR. WONG:** Objection; vague and ambiguous.  
 06:04 17 **THE WITNESS:** I can think of maybe PTP clock  
 06:04 18 priority 1 or PTP prior one. I think there could be  
 06:04 19 different ways of defining the same parameter in the  
 06:04 20 slightly different way.

06:04 21 **Q** And when counsel was asking you some  
 06:04 22 questions towards the end you talked about having the  
 06:04 23 ability to use different types of commands for the  
 06:04 24 same functionality. Do you recall that testimony?

06:04 25 **A Different types of commands.**

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06:01 1 any one of these interfaces for the particular

06:01 2 features that are specified in the IEEE document?

06:01 3 **MR. WONG:** Objection; incomplete  
 06:01 4 hypothetical; vague and ambiguous.

06:01 5 **THE WITNESS:** I would think the same set of  
 06:01 6 attributes and parameters should be able to come from  
 06:01 7 a GUI interface.

06:01 8 **MR. PAK:** Q. You were also asked by counsel  
 06:01 9 some statements from the IEEE document and there was  
 06:01 10 testimony that you gave which indicated your  
 06:02 11 understanding that for mandatory functionality there  
 06:02 12 would be no deviation of the behavior; do you recall  
 06:02 13 that testimony?

06:02 14 **A Yes.**

06:02 15 **Q** Okay. When you said no deviation of the  
 06:02 16 behavior, what did you mean by that?

06:02 17 **A That the external feature or functionality of**  
 06:02 18 **the PTP clock should be consistent with the spec, but**  
 06:02 19 **that doesn't imply the CLI part. I think that's what**  
 06:02 20 **I want to say. It's the feature part.**

06:02 21 **Q** And can you elaborate on that? What do you  
 06:02 22 mean when you say it doesn't imply the CLI part in  
 06:02 23 your answer?

06:02 24 **A So I think the standard describes how the PTP**  
 06:02 25 **clock functions and that's -- to me that's the feature**

06:04 1 **Q** Or different commands, yes.

06:04 2 **A Different commands, yes.**

06:04 3 **Q** Okay. And again if you're looking at the PTP  
 06:04 4 priority 2 command, is it possible to have different  
 06:04 5 commands for the functionality of the PTP priority 2  
 06:04 6 based on your understanding of the IEEE specification?

06:05 7 **A Yeah, you could say PTP, saying PTP clock**  
 06:05 8 **priority 2 or priority-two.**

06:05 9 **Q** And then let's just go through the rest of  
 06:05 10 the commands we discussed during your initial  
 06:05 11 examination.

06:05 12 **If you turn now to now on page -- actually on**  
 06:05 13 **the same page, page 24, PTP sync interval, yet are**  
 06:05 14 **there different ways of expressing the command for**  
 06:05 15 **that same function of PTP sync interval?**

06:05 16 **A Maybe PTP sync-interval, or PTP interval and**  
 06:06 17 **then space sync as there could be multiple different**  
 06:06 18 **types of intervals that you can define with PTP clock.**

06:06 19 **Q** Let's take that example. If I had PTP sync  
 06:06 20 interval which is what you selected and compare that  
 06:06 21 to PTP interval sync, based on your experience with  
 06:06 22 CLI commands, would those two commands have the same  
 06:06 23 command hierarchy or different command hierarchies?

06:06 24 **A You mean, with dash or without dash?**  
 06:06 25 **Q** Without dash.

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06:06 1 A It's going to be different depending on  
 06:06 2 whether -- so how you look at, right. If you want to  
 06:06 3 have multiple intervals, then you put interval first  
 06:06 4 and then you have interval sync, interval something  
 06:06 5 else.

06:06 6 I think at the time we chose this form was  
 06:06 7 because there were other sync parameters than  
 06:07 8 interval. So we did sync and then under that you can  
 06:07 9 have sub commands of different options to configure.

06:07 10 Q And the safety example of carrying PTP space  
 06:07 11 sync interval compared to PTP sync-interval, would  
 06:07 12 those two commands have the same hierarchy or  
 06:07 13 different command hierarchies?

06:07 14 A PTP sync interval would give you one more  
 06:07 15 level of hierarchy while PTP sync-interval is -- this  
 06:07 16 term is on the same level, right. Sync and interval.  
 06:07 17 It's just one key word. So it's different. It's one  
 06:07 18 more level of hierarchy with a space.

06:07 19 Q So in that example, PTP sync interval, how  
 06:08 20 many levels would you have in the command hierarchy?

06:08 21 A Three.

06:08 22 Q And in the other example of PTP  
 06:08 23 sync-interval, how many levels would you have in the  
 06:08 24 command hierarchy?

06:08 25 A Two.

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06:09 1 device.

06:09 2 MR. PAK: So.

06:09 3 THE WITNESS: That's my understanding.

06:10 4 MR. PAK: So would your Cisco product that  
 06:10 5 used your CLI interface for the PTP commands, would --  
 06:10 6 would that be product be interoperable in a Plug Fest  
 06:10 7 environment with a Siemens product that used a GUI  
 06:10 8 interface G-U-I interface for PTP?

06:10 9 MR. WONG: Objection; incomplete  
 06:10 10 hypothetical; foundation.

06:10 11 THE WITNESS: Okay. It would be. It doesn't  
 06:10 12 matter how you configure or reach this state, right.  
 06:10 13 It's the -- it's the clock behavior, the device that  
 06:10 14 are interoperable.

06:10 15 MR. PAK: Okay.

06:10 16 Q Just to be clear on the record about your  
 06:10 17 experience in this regard, you worked on the PTP  
 06:10 18 implementation for Cisco; correct?

06:10 19 A Yes.

06:10 20 Q You also read the IEEE PTP specification as  
 06:10 21 part of your work for Cisco; correct?

06:10 22 A Yes.

06:10 23 Q And your implementation that for the PTP  
 06:10 24 protocol for Cisco was then, to your knowledge, used  
 06:11 25 at Plug Fest?

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06:08 1 Q Another topic that was discussed during your  
 06:08 2 examination was Plug Fest; do you recall that?

06:08 3 A Yes.

06:08 4 Q Okay. When you were talking about  
 06:08 5 interoperability of vendor products for Plug Fest,  
 06:08 6 what did you mean by that?  
 06:08 7 A It's the -- when the vendors support PTP v2,  
 06:08 8 when their devices are connected together they should  
 06:08 9 be able to sync to the same master clock or grand  
 06:08 10 master clock, and they would be able to calculate  
 06:09 11 based on the PTP algorithm to sync the time, calculate  
 06:09 12 delays and all of those. So these are the behavior --  
 06:09 13 behavior-wise. They should all comply to the  
 06:09 14 standard, PTP standard.

06:09 15 Q Based on your understanding of Plug Fest and  
 06:09 16 the PTP IEEE standard, can you have the type of  
 06:09 17 behavioral interoperability that you talked about  
 06:09 18 while having different types of command interfaces for  
 06:09 19 the different vendor products?

06:09 20 MR. WONG: Objection; calls for expert  
 06:09 21 testimony.

06:09 22 THE WITNESS: Yes. How you achieve the  
 06:09 23 configuration of the clock could be very different.  
 06:09 24 The interoperability is on the -- on the behavior, on  
 06:09 25 the features. Not on how you configure the -- the

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06:11 1 A Yes.

06:11 2 Q And in doing that, you understood generally  
 06:11 3 what the requirements of Plug Fest interoperability  
 06:11 4 are; correct?

06:11 5 A Yes.

06:11 6 MR. WONG: Objection; leading.

06:11 7 MR. PAK: Okay.

06:11 8 Q And what is your understanding of the  
 06:11 9 requirements of Plug Fest interoperability?

06:11 10 A I don't recall all of the requirement. Our  
 06:11 11 focus at the time was on the clock side that Cisco's  
 06:11 12 \*\*Guy can -- can be selected as master clock and it  
 06:11 13 can sync to master clock if some other vendor's device  
 06:11 14 were selected as master clock. So it's on the -- on  
 06:11 15 the timing and on the clock behavior part.

06:11 16 Q So why don't you pull out Exhibit No. 93  
 06:12 17 which is again the IEEE standard for the precision  
 06:12 18 clock synchronization protocol.

06:12 19 A Okay.

06:12 20 Q Do you recall that counsel showed you some  
 06:12 21 pages from this document; correct?

06:12 22 A Yes.

06:12 23 Q Okay. I'm going to show you some additional  
 06:12 24 pages that relate to the questions that he asked.

06:12 25 A Okay.

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06:31 1 Q Are you aware of other e-mails that exist  
 06:31 2 that list out the various options that you actually  
 06:31 3 considered for each of these commands?  
 06:31 4 **A I don't remember there would be e-mails with**  
 06:31 5 **the parser police. We only consult them as the very**  
 06:31 6 **last stage.**

06:32 7 Q Are there any e-mails in your recollection in  
 06:32 8 general, not just with the parser police, but with  
 06:32 9 your colleagues on the team that list out the various  
 06:32 10 options that you actually considered when coming up  
 06:32 11 with any of these commands listed on Exhibit 96?

06:32 12 **A I don't recall that detail.**

06:32 13 Q Okay. Were there any other documents besides  
 06:32 14 e-mails where you would have listed out alternatives  
 06:32 15 that you actually considered back in 2008 when you  
 06:32 16 were coming up with the commands that are proposed in  
 06:32 17 Exhibit 96?

06:32 18 **A There could be conversations in meetings, but**  
 06:32 19 **as to e-mails, I'm not -- I don't recall the details.**

06:32 20 **I don't remember other e-mails.**

06:32 21 Q Okay. So the only document that we have that  
 06:32 22 what commands were considered for these PTP functions  
 06:32 23 is Exhibit 96; correct?

06:33 24 **A Yes, these e-mails are the ones as far as I**  
 06:33 25 **can see.**

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06:33 1 Q Okay. And you -- did you destroy any  
 06:33 2 documents while you were at Cisco that might have  
 06:33 3 contained other alternatives that you considered for  
 06:33 4 any of the PTP commands that we discussed today?

06:33 5 **A No, I wouldn't have.**

06:33 6 Q Okay. And in preparing for this deposition,  
 06:33 7 did you see any other documents that showed any  
 06:33 8 alternatives to any of the PTP commands that are  
 06:33 9 listed in Exhibit 96?

06:33 10 **A In preparation, I only saw these e-mails.**

06:33 11 Q Okay.

06:33 12 **A But, again, I don't recall during the time of**  
 06:34 13 **the few months of development whether there was any**  
 06:34 14 **written record of alternatives. It's -- on my mind**  
 06:34 15 **it's not 100 percent sure there was written record.**

06:34 16 Q Okay. In fact you're not even sure how long  
 06:34 17 it took for you to even come up with these commands as  
 06:34 18 compared to the development; right?

06:34 19 **A I don't remember that part.**

06:34 20 Q Right.

06:34 21 **A Of the detail.**

06:34 22 Q That the part of coming up with these  
 06:34 23 commands is not as fresh in your memory; correct?

06:34 24 MR. PAK: Objection; mischaracterizes the  
 06:34 25 witness's testimony.

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1 THE WITNESS: I would -- I'm pretty sure I 06:34  
 2 came with all of these commands. 06:34  
 3 MR. WONG: Okay. 06:34  
 4 THE WITNESS: I was the main developer. 06:34  
 5 MR. WONG: Okay. 06:34  
 6 Q But you don't remember -- 06:34  
 7 A Of all of this. 06:34  
 8 Q I'm sorry. Please finish your answer. 06:34  
 9 A Right. 06:34  
 10 Q But you don't remember whether you spent a 06:34  
 11 day or an hour or five minutes coming up with any of 06:34  
 12 these commands; correct? 06:35  
 13 A Right, I don't remember particular to each 06:35  
 14 command how much time I spent on that. 06:35  
 15 MR. WONG: Okay. I have no further 06:35  
 16 questions. 06:35  
 17 MR. PAK: Again, we'll just mark this as 06:35  
 18 confidential under the protective order and I don't 06:35  
 19 have any further questions. 06:35  
 20 THE VIDEOGRAPHER: All right. This will 06:35  
 21 complete Ms. Lu's deposition consisting of three 06:35  
 22 original discs which will be retained by Veritext. 06:35  
 23 The time is 3:36. We are going off the record. 06:35  
 24 (WHEREUPON, the deposition ended 06:35  
 25 at 3:36 p.m.) 06:35

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